

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Notice of Public Hearing to Consider Amendments to Regulations
Regarding the State 24-Hour Ambient Air Quality Standard for
Sulfur Dioxide

Agenda Item No.: 91-9-1

Public Hearing Date: October 11, 1991

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant
environmental issues pertaining to this item. The staff report
identified no adverse environmental effects.

Response: N/A

Certified: Pat Hutchens
Pat Hutchens
Board Secretary

Date: 1/13/92

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RESOURCES AGENCY OF CALIFORNIA

State of California
AIR RESOURCES BOARD

Resolution 91-44

October 10, 1991

Agenda Item No.: 91-9-1

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Health and Safety Code section 39606(b) requires the Board to adopt standards of ambient air quality in consideration of the public health, safety and welfare, including but not limited to health, illness, irritation to the senses, aesthetic value, interference with visibility, and effects on the economy;

WHEREAS, Health and Safety Code section 39606(b) provides that standards relating to health effects shall be based upon the recommendation of the State Department of Health Services;

WHEREAS, the Board periodically reviews existing state ambient air quality standards to ensure that they reflect current scientific knowledge;

WHEREAS, the current state 24-hour averaged ambient air quality standard for sulfur dioxide was adopted in 1977 and is based upon evidence of increased incidence of respiratory disease in humans and increased risk of mortality in humans;

WHEREAS, the current state 24-hour averaged ambient air quality standard for sulfur dioxide is violated when the 24-hour averaged sulfur dioxide concentration equals or exceeds 0.05 parts per million (ppm) at the same time as either the oxidant standard of 0.10 ppm (measured as ozone and not to be equaled or exceeded) or the total suspended particulate matter (TSP) standard of 100 micrograms per cubic meter is violated;

WHEREAS, the Board has received and considered a recommendation from the Department of Health Services dated January 24, 1991 to replace the existing state 24-hour averaged ambient air quality standard for sulfur dioxide with an ambient air quality standard for sulfur dioxide of 0.04 ppm (not to be exceeded), with no requirement for a concurrent violation of either the total suspended particulate matter standard or the oxidant standard (measured as ozone);

WHEREAS, it is Board policy, when reviewing an ambient air quality standard, to revise the definition of compliance with the standard such that the standard is violated when concentrations "exceed" rather than "equal or exceed" the level of the standard;

WHEREAS, the ARB staff has proposed to amend the 24-hour ambient air quality standard for sulfur dioxide by: lowering the numerical value of the standard to 0.04 ppm; changing the basis for determining violations of the standard to "not to be exceeded" (rather than "equal or exceed"); and uncoupling the standard from the current requirement of concurrent exceedance of either the total suspended particulate matter standard or the ozone standard.

WHEREAS, the Board has reviewed and considered a substantial body of evidence both written and oral, presented to it by staff, the Department of Health Services, other scientists, industry representatives, and other members of the public relating to the proposed amendment of the standard;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project which may have significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

At the request of the ARB staff, the Department of Health Services has reviewed 48 research studies, all published since the 24-hour sulfur dioxide standard was revised in 1977, which concern the adverse respiratory health effects from exposure to sulfur dioxide;

Epidemiological studies demonstrate an association between long-term exposure to sulfur dioxide (24-hour exposures or longer) and adverse respiratory health effects. These effects include an increased incidence of respiratory symptoms and disease, decrements in respiratory function, and an increased risk of mortality;

The data from the epidemiological studies support a 24-hour averaged ambient air quality standard for sulfur dioxide that is not coupled to particulate matter concentrations;

The Department of Health Services cited epidemiological studies that indicate an association between sulfur dioxide exposure at or above levels of 0.06 ppm and adverse respiratory health effects, thus establishing a "low adverse effects" level;

The Department of Health Services cited epidemiological studies that establish a "no adverse effects" level for sulfur dioxide respiratory effects at 24-hour sulfur dioxide concentrations of 0.04 ppm and below;

The adverse respiratory health effects seen in the epidemiological studies were probably not caused by sulfur dioxide alone; rather, it appears that sulfur dioxide serves as an effective and useful surrogate for other related pollutants (such as sulfuric acid, sulfates, or particulate matter) in addition to itself;

The scientific basis of the current combination sulfur dioxide/oxidant (measured as ozone) standard is weakened due to methodological problems that may have occurred in the study by Hazucha and Bates (1975), which served as the basis for the sulfur dioxide/oxidant standard;

Research has been published that reports a combined sulfur dioxide/ozone effect, but the data are more appropriate to short-term sulfur dioxide exposure and to the one-hour sulfur dioxide standard, not the 24-hour standard;

The Department of Health Services' Air Quality Advisory Committee (AQAC), an independent advisory group, has reviewed the DHS findings and concurred with their interpretation of recent research results; and

In addition, the Department of Health Services asked an independent group of scientists with expertise in air pollution epidemiology to review the DHS findings. Their comments are reflected in the final DHS findings.

WHEREAS, the Board further finds that amendments of the regulations set forth in Attachment A will not have a significant adverse environmental impact.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby adopts the amendments to sections 70100 and 70200, and the repeal of section 70201, Title 17, California Code of Regulations, as set forth in Attachment A hereto.

I hereby certify that the above is a true and correct copy of resolution 91-44, as adopted by the Air Resources Board.

Pat Hutchens 6/25/92
Pat Hutchens
RESOLUTIONS
APPROVED BY THE BOARD
JUN 25 1992
AIR RESOURCES BOARD

ATTACHMENT A

1. Amend section 70100, Title 17, California Code of Regulations, to read as follows¹:

Article 2. Ambient Air Quality Standards

70100. Definitions.

*** [(a)-(j) no change]

(k) Total Suspended Particulate Matter. Total suspended particulate matter refers to suspended atmospheric particles of any size, solid and liquid, except uncombined water. Total suspended particulate matter is to be measured by the high volume sampler method or by an equivalent method, ~~for purposes of monitoring for compliance with the 24-hour Sulfur Dioxide (SO₂) standard.~~

*** [(l)-(s) no change]

NOTE: Authority cited: Sections 39600 and 39601, Health and Safety Code.
Reference: Sections 39602 and 39606 (b), Health and Safety Code.

1. Section 70100, Definitions., includes 20 definitions for pollutants or terms describing standards or pollutants. Only those definitions proposed to be amended are shown.

2. Amend section 70200, Title 17, California Code of Regulations, to read as follows¹:

70200. Table of Standards^{***}

Substance	Concentration and Methods**	Duration of Averaging Periods	Most Relevant Effects	Comments
	* * *	* * *	* * *	* * *
Sulfur Dioxide (SO ₂)	0.25 ppm** flour- 1 hour escence method	1 hour	a. Bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.	The standard is designed to protect against adverse effects from short-term (5-10 min.) peak exposures.
	<u>0.04</u> 0-05 ppm** flour- 24 hours escence method, with oxidant, (ozone) equal to or greater than the state standard, or with total suspended particulate matter equal to or greater than the state 24-hour suspended particulate matter standard. ^{****}	24 hours	a. Will help prevent respiratory disease in children b. Higher concentrations associated with excess mortality. a. <u>Increased incidence of pulmonary disease and symptoms, decreased pulmonary function, and increased risk of mortality.</u>	a. Further studies on co-carcinogenic role are necessary. b. Does not include effects on vegetation, ecosystems and materials. c. May not include a margin of safety. <u>Effects may not be due to SO₂ alone, but also suspended particulate matter, including sulfates and acids.</u>
Visibility Reducing Particles	In sufficient ^{****} amount to produce extinction of 0.23 Pacific per kilometer due to particles when relative humidity is less than 70 percent. Measurement in accordance with ARB Method V.	8 hour (10 AM-6PM Pacific Standard Time)	Visibility impairment on days when relative humidity is less than 70 percent.	This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile visual range when relative humidity is less than 70 percent.

Visibility
Reducing
Particles
(Applicable
only in
Lake Tahoe
Air Basin)

In sufficient amount to produce extinction of 0.07 per kilometer due to particles when relative humidity is less than 70 percent. Measurement in accordance with ARB Method V.

***** 8 hour (10 AM-6PM Pacific Standard Time)
Reduction in scenic quality on days when the relative humidity is less than 70 percent.

This standard is equivalent to a 30-mile visual range when relative humidity is less than 70 percent.

* * * * *

* Any equivalent procedure which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used.

** These standards are violated when concentrations exceed those set forth in the body of the regulation. All other standards are violated when concentrations equal or exceed those set forth in the body of the regulation.

*** Applicable statewide unless otherwise noted.

**** ~~The 24-hour suspended particulate matter standard referred to is that adopted by the Board in 1969, of 100-ug/m³ as measured by high volume sampler.~~

***** ~~These standards are violated when particle concentrations cause measured light extinction values to exceed those set forth in the regulations.~~

NOTE: Authority cited: Section 39600, 39601 (a) and 39606 (b), Health and Safety Code.
Reference: Sections 39014, 39606 (b), 39701 and 39703 (f), Health and Safety Code.

1. The Table of Standards, section 70200, includes standards for nine pollutants. Only those standards proposed to be amended are shown.

3. Repeal section 70201, Title 17, California Code of Regulations, as follows:

70201. Determination of 24-hour SO₂ Standard.

In connection with measurements taken to determine compliance with the 24-hour SO₂ standard established section 70200:

(a) The SO₂ concentration, the oxidant concentration, and/or the total suspended particulate concentration are to be measured at the same monitoring station.

(b) A single sulfur dioxide average concentration is to be determined over a fixed, continuous 24-hour interval beginning and ending on the hour. The 24-hour interval shall be the same as that used for the determination of total suspended particulate concentration. A midnight to midnight 24-hour period is recommended.

(c) If the average concentration of oxidant equals or exceeds the State standard of 0.10 ppm during any clock-hour interval of the 24 hour interval in which the average concentration of sulfur dioxide equals or exceeds 0.05 ppm, the 24-hour State standard for sulfur dioxide is deemed to have been violated.

(d) If the 24-hour interval over which sulfur dioxide and total suspended particulate are measured includes any portion of two calendar days, any violation is to be assigned to that day which contains the larger portion of the hours of the 24-hour interval, or to the first day if it encompasses twelve hours from each day.

(e) If the sulfur dioxide standard is violated concurrently with both the total suspended particulate matter and oxidant standards on the same day, only one violation of this standard will be deemed to have occurred.

NOTE: Authority cited: Section 39601, Health and Safety Code. Reference: Section 39606, Health and Safety Code.

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